

Amendment under 37 CFR 1.111
Serial No. 09/395,935
Attorney Docket No. 991014

AMENDMENTS TO THE CLAIMS:

This listing of claims replaces all prior versions of claims in the application.

Listing of Claims:

Claim 1 (Currently Amended): An image pickup apparatus comprising: image pick up means capable of taking images of the same object at a plurality of different exposure amounts to generate image signals corresponding to a plurality of frames of different exposure amounts; means for generating wide dynamic range, synthesized image by synthesizing image signals corresponding to a plurality of frames of different exposure amounts obtained by the image pickup means; and a normal taking control means based on a normal taking mode for generating image pickup signals corresponding to one frame from said image pickup means, by one taking of image based on normal AE information; said image pickup apparatus further comprising:

at least an automatic wide dynamic range taking control means among a forced wide dynamic range taking control means based on a forced wide dynamic range taking mode for forcing a generation of wide dynamic range, synthesized image, and the automatic wide dynamic range taking control means based on an automatic wide dynamic range taking mode for automatically controlling ON/OFF of generation processing of a wide dynamic range, synthesized image by determining selectively generating wide dynamic range, synthesized image automatically based at least on an information set for the image taking among object information

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or information set for the image taking whether it is suitable for wide dynamic range image taking or not; and

means for selectively setting one image taking mode out of the taking modes respectively corresponding to these control means.

Claim 2 (Withdrawn): An image pickup apparatus comprising: image pickup means capable of taking images of the same object at a plurality of different exposure amounts to generate image signals corresponding to a plurality of frames of different exposure amounts; and means for generating wide dynamic range, synthesized image by synthesizing image signals corresponding to a plurality of frames of different exposure amounts obtained by the image pickup means, said image pickup apparatus further comprising:

means for displaying as a suitability determining information of the synthesized image generating process at least one information out of information based on previously taken image data, information obtained before the taking of image, and information set on the image pickup apparatus before the taking of image that is required in determining whether a suitable wide dynamic range, synthesized image can be obtained.

Claim 3 (Withdrawn): An image pickup apparatus comprising: image pickup means capable of taking images of the same object at a plurality of different exposure amounts to generate image signals corresponding to a plurality of frames of different exposure amounts; and

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means for generating wide dynamic range, synthesized image by synthesizing image signals corresponding to a plurality of frames of different exposure amounts obtained by the image pickup means, said image pickup apparatus further comprising:

means for determining the suitability to the generation processing of synthesized image of at least one information out of information based on previously taken image data, information obtained before the taking of image, and information set on the image pickup apparatus before the taking of image that is required in determining whether a wide dynamic range, synthesized image can be suitably generated; and

display means for displaying a result of determination at the determination means.

Claim 4 (Withdrawn): The image pickup apparatus according to claim 3, wherein said display means displays information determined as unsuitable as N.G. information when it is determined as unsuitable by said determination means.

Claim 5 (Withdrawn): The image pickup apparatus according to claim 3, wherein said display means displays a result of determination at said determination means as a numerical parameter of information and at the same time displays a suitable range for synthesizing process of the information numeric parameter.

Claim 6 (Withdrawn): The image pickup apparatus according to claim 4, wherein said display means displays a result of determination at said determination means as a numerical parameter of information and at the same time displays a suitable range for synthesizing process of the information numeric parameter.

Claim 7 (Withdrawn): An image pickup apparatus comprising: image pickup means capable of taking images of the same object at a plurality of different exposure amounts to generate image signals corresponding to a plurality of frames of different exposure amounts; and means for generating wide dynamic range, synthesized image by synthesizing image signals corresponding to a plurality of frames of different exposure amounts obtained by the image pickup means, said image pickup apparatus further comprising:

at least two control means among a normal taking control means based on a normal taking mode for generating image pickup signals corresponding to one frame from said image pickup means, a forced wide dynamic range taking control means based on a forced wide dynamic range taking mode for forcing a generation of wide dynamic range, synthesized image, and an automatic wide dynamic range taking control means based on an automatic wide dynamic range taking mode for selectively generating wide dynamic range, synthesized image automatically on the basis of object information or information set for the image taking; means for selectively setting one image taking mode out of the taking modes respectively corresponding to the two control means;

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suitability determination means for determining whether information obtained as conditions of generation processing for the generation of wide dynamic range, synthesized image is the information suitable for the generation processing of wide dynamic range, synthesized image; and

display means for displaying “inconsistency” when the taking mode set at said mode setting means and the result of determination made at said suitability determination means are not suitable to each other.

Claim 8 (Withdrawn): An image pickup apparatus comprising: image pickup means capable of taking images of the same object at a plurality of different exposure amounts to generate image signals corresponding to a plurality of frames of different exposure amounts; and means for generating wide dynamic range, synthesized image by synthesizing image signals corresponding to a plurality of frames of different exposure amounts obtained by the image pickup means, said image pickup apparatus further comprising:

means for displaying an exposure amount ratio of the image signals corresponding to a plurality of frames of different exposure amounts.

Claim 9 (Withdrawn): An image pickup apparatus comprising: image pickup means capable of taking images of the same object at a plurality of different exposure amounts to generate image signals corresponding to a plurality of frames of different exposure amounts; and

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means for generating wide dynamic range, synthesized image by synthesizing image signals corresponding to a plurality of frames of different exposure amounts obtained by the image pickup means, said image pickup apparatus further comprising:

means for correcting exposure amounts of said image signals corresponding to a plurality of frames of different exposure amounts; and

display means for displaying operation status of the means for correcting exposure amount.

Claims 10 – 12 (Canceled).

Claim 13 (Withdrawn): An image pickup apparatus comprising: image pickup means capable of taking images of the same object at a plurality of different exposure amounts to generate image signals corresponding to a plurality of frames of different exposure amounts; and means for generating wide dynamic range, synthesized image by synthesizing image signals corresponding to a plurality of frames of different exposure amounts obtained by the image pickup means, said image pickup apparatus further comprising:

at least two control means among a normal taking control means based on a normal taking mode for generating image pickup signals corresponding to one frame from the image pickup means, a forced wide dynamic range taking control means based on a forced wide dynamic range taking mode for forcing a generation of wide dynamic range, synthesized image,

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and an automatic wide dynamic range taking control means based on an automatic wide dynamic range taking mode for selectively generating wide dynamic range, synthesized image automatically on the basis of object information or information set for the image taking;

means for selectively setting one image taking mode out of the taking modes respectively corresponding to the two control means;

suitability determination means for determining whether information obtained as the conditions of generation processing for the generating wide dynamic range, synthesized image is the information suitable for the generation processing of wide dynamic range, synthesized image; and

means for directing a change in the setting of parameter of said information or in the setting of taking mode or directing a retake when the taking mode set at said mode setting means and the result of determination made at said suitability determination means are not suitable to each other.

Claim 14 (Withdrawn): An image pickup apparatus comprising: image pickup means capable of taking images of the same object at a plurality of different exposure amounts to generate image signals corresponding to a plurality of frames of different exposure amounts; and means for generating wide dynamic range, synthesized image by synthesizing image signals corresponding to a plurality of frames different exposure amounts obtained by the image pickup means, said image pickup apparatus further comprising:

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means for displaying brightness information of a desired portion of object together with an image of the object.

Claim 15 (Withdrawn): An image pickup apparatus comprising: image pickup means capable of taking images of the same object at a plurality of different exposure amounts to generate image signals corresponding to a plurality of frame of different exposure amounts; and means for generating wide dynamic range, synthesized image by synthesizing image signals corresponding to a plurality of frames of different exposure amounts obtained by the image pickup means, said image pickup apparatus further comprising:

means for designating a plurality of desired regions of a displayed image;

means for obtaining luminance information of the regions designated by the designating means; and

means for adjusting exposure amounts of said plurality of images so as to achieve suitable luminance levels of the respectively obtained luminance information at the time of generating a wide dynamic range, synthesized image.

Claim 16 (Withdrawn): The image pickup apparatus according to claim 15, wherein said means for designating a plurality of desired regions of image includes means for marking by setting and locking a previously set, framed narrow region on a target object in the image.

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Claim 17 (Withdrawn): An image pickup apparatus comprising: image pickup means capable of taking images of the same object at a plurality of different exposure amounts to generate image signals corresponding to a plurality of frames of different exposure amounts; and means for generating wide dynamic range, synthesized image by synthesizing image signals corresponding to a plurality of frames of different exposure amounts obtained by the image pickup means, said image pickup apparatus further comprising:

means for setting the exposure amounts of each of a plurality of images of different exposure amounts to a desired exposure amount considered by the user, the dynamic range of the synthesized image being set on the basis of the exposure amounts respectively set for said plurality of images.

Claim 18 (Withdrawn): An AE device in image pickup apparatus comprising:
means for controlling exposure amount to an image pickup device;
control means for setting a plurality of different exposure amounts to the means for controlling exposure amount;
means for acquiring a plurality of output information based on the plurality of exposure amounts set from the image pickup device;
means for generating synthesized output information of wide dynamic range by synthesizing the plurality of acquired output information; and

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means for deciding exposure amounts for normal image taking from the synthesized output information.

Claim 19 (Withdrawn): The image pickup apparatus according to claim 17 further comprising:

a display means for respectively displaying a plurality of images of different exposure amounts; and

means for setting the exposure amount of each of said plurality of images of different exposure amounts to a desired exposure amount so that the luminance of object portions designated by the user within the image displayed by said display means is respectively brought to a suitable level in a wide dynamic range, synthesized image, the dynamic range of the synthesized image being set on the basis of the exposure amounts respectively set for said plurality of images.

Claim 20 (Withdrawn): The image pickup apparatus according to claim 19, wherein said desired exposure amount setting means sets the exposure amount of each of said plurality of images of different exposure amounts to a desired exposure amount from a darkest portion luminance information of the darkest region and a brightest portion luminance information of the brightest region designated by the user within the object of a previously taken image.

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Claim 21 (Withdrawn): The image pickup apparatus according to claim 17 further comprising a display means for respectively displaying a plurality of images of different exposure amounts, wherein said desired exposure amount setting means sets to desired exposure amount by considering the range without lack of detail at high level portion and the range without lack of detail at low level portion from the images displayed by said display means.

Claim 22 (Cancelled).

Claim 23 (Currently Amended): The image pickup apparatus according to claim 22 1 further comprising a motion detecting section for detecting motion in the object to be taken, wherein said automatic wide dynamic range taking control means controls ON/OFF of the generation processing of a wide dynamic range, synthesized image based on an output of said motion detecting section.

Claim 24 (Previously Presented): The image pickup apparatus according to claim 23, wherein said motion detecting section detects motion in the object based on short-time exposure image data and long-time exposure image data.

Claim 25 (Previously Presented): An image pickup apparatus comprising: image pickup means capable of taking images of the same object at a plurality of different exposure amounts to generate image signals corresponding to a plurality of frames of different exposure amounts; and means for generating wide dynamic range, synthesized image by synthesizing image signals corresponding to a plurality of frames of different exposure amounts obtained by the image pickup means; said image pickup apparatus further comprising:

an automatic wide dynamic range taking control means for automatically controlling ON/OFF of generation processing of a wide dynamic range, synthesized image by determining based on object information or information set for the image taking whether it is suitable for wide dynamic range image taking or not;

a motion detecting section for detecting motion in the object to be taken, wherein said automatic wide dynamic range taking control means controls ON/OFF of the generation processing of a wide dynamic range, synthesized image based on an output of said motion detecting section; and

an autofocus (AF) circuit, wherein said motion detecting section detects motion in the object based on AF signal from said AF circuit.

Claim 26 (Currently Amended): The image pickup apparatus according to claim 22 1 further comprising a camera shake detection circuit, wherein said automatic wide dynamic range

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taking control means controls ON/OFF of the generation processing of a wide dynamic range, synthesized image based on an output of said camera shake detection circuit.

Claim 27 (Currently Amended): The image pickup apparatus according to claim 1 or 22, wherein said information set for the image taking is a taking mode setting information among a consecutive taking mode, sports taking mode, strobe taking mode, scenery taking mode, and macro-strobe taking mode, or shutter speed or zoom power.

Claim 28 (Withdrawn): The image pickup apparatus according to claim 17 further comprising: at least one control means among a forced wide dynamic range taking control means for forcing a generation of wide dynamic range, synthesized image, and an automatic wide dynamic range taking control means for selectively generating wide dynamic range, synthesized image automatically on the basis of object information or information set for the image taking; and means for selectively setting one control means from these control means.